Chapter I: Introduction

The U.S. Environmental Protection Agency (EPA, the Agency) prepared this Regulatory Impact Analysis (RIA) for its proposed rule on Tier 2 Motor Vehicle Emissions Standards and Gasoline Sulfur Control Requirements. The purpose of this RIA is to present EPA's estimates of the likely costs, benefits, and industry impacts associated with the implementation of both the Tier 2 vehicle standards and the gasoline sulfur requirements.

The remainder of this chapter summarizes the background information and provisions of the proposed rulemaking. Subsequent chapters in this RIA present the following information:

- **Chapter II** presents the health and welfare concerns of motor vehicle emissions including, ozone (and ozone precursors), particulate matter, and carbon monoxide.

- **Chapter III** summarizes our analysis of the impact of the Tier 2/Sulfur proposal on emission inventories, ozone and visibility levels, and air toxics emissions and exposures.

- **Chapter IV** examines the technological feasibility of the proposed Tier 2 exhaust emissions standards for light-duty vehicles (LDVs) and light-duty trucks (LDTs), as well as the feasibility of removing sulfur from gasoline.

- **Chapter V** talks about the economic impact of the proposed rule, including the impact of the proposed Tier 2 standards on vehicle costs, the impact of the gasoline sulfur requirements on gasoline desulfurization costs, and the combined vehicle and fuel costs per vehicle and nationwide.

- **Chapter VI** discusses the cost-effectiveness of the proposed vehicle and fuel standards. The analysis in this chapter focuses on the costs and emission reductions associated with a single vehicle meeting the Tier 2 emissions standards while operating on low sulfur fuel.

- **Chapter VII** analyzes and estimates the economic impact of the proposed standards by defining and quantifying the various expected consequences and representing those consequences in terms of dollars. This analysis provides a means for comparing the expected benefits of the proposed standards to the expected costs.

- **Chapter VIII** concludes this RIA with a presentation of the Initial Regulatory Flexibility Analysis for the proposed rule. This analysis evaluates the impacts of the proposed Tier 2 motor vehicle and gasoline sulfur standards on small businesses.

A. Background

On July 31, 1998, EPA submitted its *Tier 2 Report to Congress*, a formal report which contained the results of its draft Tier 2 Study.[1] The purpose of the Tier 2 Study was to examine the appropriateness of requiring more stringent emission standards for new passenger cars and light-duty trucks. More specifically, EPA was directed by Congress to assess the air quality need, technical feasibility, and cost-effectiveness of more stringent motor vehicle emission standards–emission standards more stringent than federal "Tier 1" standards.

The results of the study indicated that, beginning in 2004, emission reductions will be necessary to meet and maintain the National Ambient Air Quality Standards (NAAQS) for both ozone and particulate matter (PM). Air quality modeling showed that during 2007-10, when Tier 2 standards would be fully implemented, several areas in the U.S. would still be in nonattainment for ozone and PM, even after the implementation of existing emission controls. EPA also found ample evidence that technologies would be available to meet more stringent Tier 2 standards. In addition, the Tier 2 Study provided evidence that such standards could be implemented at a cost (per ton of reduced pollutants) comparable to the costs of other programs designed for similar air quality problems. Finally, the study identified several additional issues in need of further examination, including the relative stringency of car and light truck emission standards, the appropriateness of identical versus different standards for gasoline and diesel vehicles, and the effects of sulfur in gasoline on vehicle catalyst efficiency.

On May 1, 1998, EPA released its *Staff Paper on Gasoline Sulfur Issues* which presented its understanding of the impact of gasoline sulfur on emissions from motor vehicles and explored what gasoline producers and automobile manufacturers could do to reduce sulfur's impact on emissions. The staff paper noted that gasoline sulfur is a catalyst poison and that high sulfur levels in commercial gasoline could affect the ability of future automobiles to meet more stringent standards in use. It also pointed out that sulfur control would provide additional benefits by lowering emissions from the current fleet of vehicles.

Based on the statutory requirements described above and the evidence provided in the Tier 2 Study, as updated in the Preamble, EPA is proposing its determination that new, more stringent emission standards are indeed needed, technologically feasible, and cost effective.

B. Overview of the Proposal

Although the nation's air quality is improving, tens of millions of Americans will continue to be exposed to unhealthy air pollution levels in the future if new emission controls are not imposed on motor vehicles. EPA is therefore proposing a major, comprehensive program designed to significantly reduce emissions from passenger cars and light trucks (including sport-utility vehicles, minivans, and pickup trucks). Under the proposed program, automakers would

[1] On April 28, 1998, EPA published a notice of availability announcing the release of a draft of the Tier 2 study and requesting comments on the draft. The final report to Congress included a summary and analysis of the comments EPA received.

produce vehicles designed to have very low emissions when operated on low-sulfur gasoline, and oil refiners would provide that cleaner gasoline nationwide. In the proposed rule, EPA refers to this comprehensive program as the "Tier 2/Gasoline Sulfur Control Program" or simply as the "Tier 2/Sulfur Program."

1. Vehicle Emission Standards

Today's notice proposes new federal emission standards ("Tier 2 standards") for passenger cars and light trucks. The program is designed to reduce vehicle emissions of nitrogen oxides (NOx) and non-methane organic gases (NMOG) (which consist primarily of hydrocarbons (HC) and volatile organic compounds (VOCs)); NOx and NMOG contribute to the formation of ozone and particulate matter (PM) which are harmful air pollutants. The program would also, for the first time, apply the same federal standards to passenger cars and all light trucks ("light LDTs" and "heavy LDTs").

The proposed Tier 2 standards would reduce new vehicle NOx levels to an average of 0.07 grams per mile (g/mi). For new passenger cars and light LDTs, these standards would phase in beginning in 2004, with the standards to be fully phased in by 2007.[2] For heavy LDTs, the proposed Tier 2 standards would be phased in beginning in 2008, with full compliance in 2009. During the phase-in period from 2004-2007, all passenger cars and light LDTs not certified to Tier 2 standards would have to meet an interim average standard of 0.30 g/mi NOx, equivalent to the current NLEV standards for LDVs.[3] During the period 2004-2008, heavy LDTs not certified to Tier 2 standards would phase in an average standard of 0.20 g/mi NOx, with an emissions cap of 0.60 g/mi NOx.

Manufacturers would be allowed to comply with the very stringent proposed new standards in a flexible way, assuring that the average emissions of a company's production met the target emission levels while allowing the manufacturer to choose from several more- and less-stringent emission categories for certification. The proposed requirements also include more stringent PM standards, which primarily affect diesel vehicles, and more stringent hydrocarbon controls (exhaust NMOG and evaporative emissions standards).

2. Gasoline Sulfur Standards

[2]By comparison, the NOx standards for the National Low Emission Vehicle (NLEV) program, which will be in place nationally in 2001, range from 0.30 g/mi for passenger cars to 0.50 g/mi for medium-sized light trucks. For further comparison, the standards met by today's Tier 1 vehicles range from 0.60 g/mi to 1.53 g/mi.

[3]There are also NMOG standards associated with both the interim and Tier 2 standards. The NMOG standards vary depending on which of various individual sets of emission standards manufacturers choose to use in complying with the average NOx standard. This "bin" approach is described more fully in section IV.B.

The other major part of today's proposal would significantly reduce average gasoline sulfur levels nationwide beginning in 2004, and likely earlier due to the proposed incentive program to encourage early sulfur reductions. Refiners would generally install advanced refining equipment to remove sulfur in their refining processes. Importers of gasoline would be required to import and market only gasoline meeting the proposed sulfur limits. Temporary, less stringent standards would apply to certain small refiners.

EPA is proposing that gasoline produced by refiners and sold by gasoline importers generally meet an average sulfur standard of 30 ppm and a cap of 80 ppm. The proposed program builds upon the existing regulations covering gasoline content as it relates to emissions performance. It includes provisions for trading of sulfur credits, increasing the flexibility available to refiners for complying with the new requirements. The proposed credit program is intended to ease compliance uncertainties by providing refiners the flexibility to phase in early controls in 2000-03 and use credits generated in these years to delay some control to 2006. As proposed, the program would achieve expected environmental benefits while providing substantial flexibility to refiners. The effect of the credit program is that those refiners that participate would have the opportunity for more overall lead-time to attain the final sulfur levels.